**Geometry SYLLABUS**   
September 2-December 19, 2008



[www.clackamasmiddlecollege.org](http://www.clackamasmiddlecollege.org)

**Instructor Information**

**Instructor**: Ameena Amdahl-Mason

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**Office Hours**: 7:45-9:15am/2:45-3:45pm or by arrangement

**CLASS Information:**

**Course Description**: Geometry is a branch of mathematics that deals with the measurement, properties, and relationships of points, lines, angles, and two- and three-dimensional figure. The topics to be studied include basic geometric figures, deductive reasoning and proofs, postulates and theorems for parallel lines and planes, corollaries and theorems for congruent triangles, properties and theorems for quadrilaterals, inequalities of triangles, and polygons.

### Credits: 0.25 Credits per term

**Class Schedule:**Monday-Wednesday-Friday, 11:15 to 12:10

**Location**: CMC main campus; math room.

**Pre-requisites:** Algebra or consent of the instructor.

**Resources**:

Students have access to resources posted on the CMC website under the instructor’s page. Included with the resources, students will also find:

* Current weekly grades posted
* Current assignments posted
* Instructions to each assignments
* Other materials to be included as the course progresses

**Supplies**: Students are to bring a writing utensil every day along with a binder, notebook paper, and completed work from the previous day, handouts given out in class, and a calculator.

**Common Curriculum Goals and standards**: You have the opportunity to learn the following literature goals and standards in this course:

**Calculations and Estimations**

Numbers: Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

* + MA.CM.CE.01 Compare real numbers.
  + MA.CM.CE.05 Apply equivalent forms of real numbers to solve problems.

Computation and Estimation: Compute fluently and make reasonable estimates.

* + MA.CM.CE.06 Compute with real numbers, including absolute value and numbers expressed in scientific notation.
  + MA.CM.CE.07 Compute with integer exponents and whole number roots.

Operations and Properties: Understand meanings of operations and how they relate to one another.

* + MA.CM.CE.13 Apply the associative, commutative, and distributive properties to simplify computations with real numbers.
  + MA.CM.CE.14 Use properties of numbers to demonstrate whether assertions are true or false.

**Measurement**

Units and Tools: Understand measurable attributes of objects and the units, systems and processes of measurement.

* + MA.CM.ME.01 Determine the appropriate units, scales, and tools for problem situations involving measurement.
  + MA.CM.ME.02 Solve problems involving unit conversions (e.g., mile per hour to feet per second) given the unit equivalencies.
  + MA.CM.ME.03 Determine the precision of a given measuring tool (e.g., 1 degree for a standard protractor).

Direct & Indirect Measurement: Apply appropriate techniques, tools, and formulas to determine measurements.

* + MA.CM.ME.04 Develop and use strategies and formulas for calculating surface area and volume of cones and spheres.
  + MA.CM.ME.05 Use formulas to solve problems involving finding missing dimensions given perimeter, area, surface area and volume of polygons, circles, prisms, pyramids, cones, cylinders, and spheres.
  + MA.CM.ME.06 Develop, understand, and use the formula for determining arc length (e.g., portion of a circle).
  + MA.CM.ME.07 Determine perimeter and area of shapes of circles and polygons (annulus, etc.) in context.
  + MA.CM.ME.08 Determine the surface area and volume of a complex figure composed of a combinations of two or more geometric figures or a figure derived from a regular solid (e.g., hemisphere, frustum of a cone).
  + MA.CM.ME.09 Compare and contrast the formulas for surface area and volume of cylinders and cones.
  + MA.CM.ME.10 Determine a shape that has minimum or maximum perimeter, area, surface area, or volume under specified conditions.
  + MA.CM.ME.11 Make and use scale drawings and models to solve problems.

**Geometry**

Properties and Relationships: Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships

* + MA.CM.GM.01 Determine defining properties that characterize classes of three-dimensional figures and their component parts.
  + MA.CM.GM.02 Recognize and represent three-dimensional figures and their component parts.
  + MA.CM.GM.03 Justify and use theorems involving the angles formed by parallel lines cut by a transversal.
  + MA.CM.GM.04 Develop, understand, and apply properties of circles and of inscribed and circumscribed polygons.
  + MA.CM.GM.05 Use measures of sides and of interior and exterior angles of polygons to classify figures and solve problems.
  + MA.CM.GM.06 Prove congruence of two triangles or their corresponding component parts.
  + MA.CM.GM.07 Determine the measures of corresponding angles, sides, and corresponding part of congruent and similar figures.
  + MA.CM.GM.08 Use angle, side length and triangle inequality relationships to solve problems.
  + MA.CM.GM.09 Use trigonometric functions, and angle and side relationships of special right triangles (30- 60-right triangles and isosceles right triangles) to solve for an unknown length and determine distances and solve problems.
  + MA.CM.GM.10 Investigate relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.
  + MA.CM.GM.11 Construct and judge the validity of a logical argument and give counterexamples to disprove a statement.
  + MA.CM.GM.12 Justify and use theorems involving the properties of triangles, quadrilaterals, circles, and their component parts to verify congruence and similarity.

Modeling: Use visualization, spatial reasoning, and geometric modeling to solve problems.

* + MA.CM.GM.13 Model, sketch, label and where appropriate construct cones and spheres, and basic elements of geometric figures (e.g., altitudes, midpoints, medians, angle bisectors, and perpendicular bisectors) using compass and straightedge or technology.
  + MA.CM.GM.14 Describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect).
  + MA.CM.GM.15 Make a model of a three-dimensional figure from a two-dimensional drawing and make a two-dimensional representation of a three-dimensional object through scale drawings, perspective drawings, blueprints or computer simulations.
  + MA.CM.GM.16 Recognize representations of three-dimensional objects from different perspectives and identify cross-sections of three-dimensional objects.

Coordinate Geometry: Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

* MA.CM.GM.17 Determine the relative placement (e.g., intersecting, parallel, perpendicular) of two lines on a coordinate plane given the algebraic equations representing them.
* MA.CM.GM.18 Calculate slope, distance and midpoint between points with an emphasis on practical applications (use coordinate formulas).

Transformations and Symmetry: Apply transformations and use symmetry to analyze mathematical situations.

* + MA.CM.GM.19 Use coordinate geometry to determine whether a figure is symmetrical with respect to a line or a point.
  + MA.CM.GM.20 Determine whether a given pair of figures on a coordinate plane represent a translation, reflection, rotation and/or dilation.
  + MA.CM.GM.21 Determine the image of a figure on a coordinate graph under translations, reflections, and rotations.
  + MA.CM.GM.22 Given a figure and its image on a coordinate graph, determine the translation vector or locate the axis of reflection.
  + MA.CM.GM.23 Determine the coordinates of and draw the dilation of a figure on a coordinate graph.
  + MA.CM.GM.24 Analyze the congruence, similarity, and line or rotational symmetry of figures using transformations.

**Mathematical Problem Solving**

Conceptual Understanding: Select, apply, and translate among mathematical representations to solve problems.

* MA.CM.PS.01 Interpret the concepts of a problem-solving task and translate them into mathematics.

Processes and Strategies: Apply and adapt a variety of appropriate strategies to solve problems.

* MA.CM.PS.02 Choose strategies that can work and then carry out the strategies chosen.

Verification: Monitor and reflect on the process of mathematical problem solving.

* MA.CM.PS.03 Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution.

Communication: Communicate mathematical thinking coherently and clearly. Use the language of mathematics to express mathematical ideas precisely.

* MA.CM.PS.04 Use pictures, symbols, and/or vocabulary to convey the path to the identified solution.

Accuracy: Accurately solve problems that arise in mathematics and other contexts.

* MA.CM.PS.05 Accurately solve problems using mathematics.

**Reading/Writing/Speaking skills**: In addition to specific skills mentioned above, CMC has identified core skills that are transferable and go beyond the context of a specific course. This class addresses the following core skills of reading/writing and speaking skills:

**Reading**

1. Concepts of Print: Analyze words, recognize words, and learn to read grade-level text fluently across the subject areas.
2. Phonemic Awareness: Analyze words, recognize words, and learn to read grade-level text fluently across the subject areas.
3. Decoding and Word Recognition: Analyze words, recognize words, and learn to read grade-level text fluently across the subject areas.
4. Listen to and Read Informational and Narrative Text: Listen to, read, and understand a wide variety of informational and narrative text across the subject areas at school and on own, applying comprehension strategies as needed.
5. Vocabulary: Increase word knowledge through systematic vocabulary development; determine the meaning of new words by applying knowledge of word origins, word relationships, and context clues; verify the meaning of new words; and use those new words accurately across the subject areas.
6. Read to Perform a Task: Find, understand, and use specific information in a variety of texts across the subject areas to perform a task.
7. Informational Text: Demonstrate General Understanding: Demonstrate general understanding of grade-level informational text across the subject areas.
8. Informational Text: Develop an Interpretation: Develop an interpretation of grade-level informational text across the subject areas.
9. Informational Text: Examine Content and Structure: Examine content and structure of grade-level informational text across the subject areas.

**Writing**

1. Planning, Evaluation, and Revision: Pre-write, draft, revise, edit, and publish across the subject areas.
2. Writing:  Communicate supported ideas across the subject areas, including relevant examples, facts, anecdotes, and details appropriate to audience and purpose that engage reader interest ; organize information in clear sequence, making connections and transitions among ideas, sentences, and paragraphs ; and use precise words and fluent sentence structures that support meaning.
3. Conventions: Spelling: Demonstrate knowledge of spelling, grammar, punctuation, capitalization, and penmanship across the subject areas.
4. Conventions: Grammar: Demonstrate knowledge of spelling, grammar, punctuation, capitalization, and penmanship across the subject areas.
5. Conventions: Punctuation: Demonstrate knowledge of spelling, grammar, punctuation, capitalization, and penmanship across the subject areas
6. Conventions: Capitalization: Demonstrate knowledge of spelling, grammar, punctuation, capitalization, and penmanship across the subject areas.
7. Conventions: Handwriting: Demonstrate knowledge of spelling, grammar, punctuation, capitalization, and penmanship across the subject areas.
8. Writing Modes: Write narrative, expository, and persuasive texts, using a variety of written forms—including journals, essays, short stories, poems, research reports, research papers, business and technical writing—to express ideas appropriate to audience and purpose across the subject areas.

**Speaking and Listening**

1. Speaking: Communicate supported ideas across the subject areas using oral, visual, and multi-media forms in ways appropriate to topic, context, audience, and purpose ; organize oral, visual, and multi-media presentations in clear sequence, making connections and transitions among ideas and elements ; use language appropriate to topic, context, audience, and purpose ; and demonstrate control of eye contact, speaking rate, volume, enunciation, inflection, gestures, and other non-verbal techniques.
2. Listening: Listen critically and respond appropriately across the subject areas.
3. Analysis: Evaluate the significance and accuracy of information and ideas presented in oral, visual, and multi-media communications across the subject areas.

**RESPONSIBILITIES and Policies:**

**Student Responsibilities:** As a student of CMC, I expect you to adhere to the policies of the school, as outlined by the Student Handbook (located on the website). You are responsible for the assignments in this class and to communicate any questions, comments or concerns you have to me. Acceptable means of communication include an appointment, e-mail, voicemail or through online discussion forums/blogs. Use of correct grammar and punctuation is required in all written communications.

Plagiarism, cheating and collusion are prohibited at CMC. Students who fail to observe these standards are subject to disciplinary action. Please refer to the CMC Student Handbook for further definitions and consequences of these behaviors, available at: [www.clackamasmiddlecollege.org](http://www.clackamasmiddlecollege.org)

**Attendance:** Attending class daily will impact a student’s opportunity to learn in a positive manner and should result in mastery of skills, benchmarks and standards mentioned above.

**Class participation:** Class participation will result in a greater understanding of the subject matter and will help in skill development. This includes classroom or online discussions, group work, project or other participation requirements that impact student’s opportunity to learn.

**Use of Electronic Devices:** Cell phones, iPods and other relevant or irrelevant electronic devices are not to interfere with the learning environment unless these electronic devices are being used for a class assignment. The instructor reserves the right to take any devices that pose a problem. If a device is taken, then it will be returned in a timely fashion with a discussion about classroom expectations. If problem persists then disciplinary action may be taken.

**Other Policies:** Refer to the CMC Student Handbook

**Instructor Responsibilities:** As your instructor, I commit to communicating openly and frequently with you about this class. I will maintain a professional, safe learning environment adhering to the policies of CMC. You can expect a reply to communication, be it via e-mail, through online discussions, voicemail or in person, within 24-48 business hours.

**Syllabus Changes:** As your instructor, I retain the right to make changes based on the timeline of the class, feedback from learners and/or logistical issues and will inform you as soon as a change is made.

**Grading Policy**:

Assignments = 30%

Applications = 40%

Tests = 30%

**Grading Scale:**

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| --- | --- |
| **Points Attained** | **Grade** |
| 90-100 | A |
| 80-89 | B |
| 70-79 | C |
| 60-69 | D |
| 50-59 | F |

**Course Topics:**

* Transformations (reflection, rotation, translation, dilation) and symmetry
* Relationships between figures (such as similarity and congruence)
* Properties of plane figures (such as equal or perpendicular sides or diagonals)
* Measurements of plane figures (such as area, perimeter, and angle measure)
* Measurements of three-dimensional shapes (such as volume and surface area)
* Tools for analyzing and measuring shapes (such as the Pythagorean Theorem, trigonometric ratios, the Laws of Sines and Cosines, and coordinate geometry)
* Investigation and proof (having found patterns, students conjecture and prove)
* Geometric construction (with compass and straightedge)